



07/23/01

Amendments To The Claims Showing All changes
Relative To The Previous Version Of That Claim

9. (Twice Amended) The auxiliary shelf mechanism of claim 1, wherein the articulating arm mechanism further comprises a second side arm and second stopping means, wherein the rear of the second side arm can contact a first side face of the second stopping means.

18. (Twice Amended) The auxiliary shelf mechanism of claim 17, wherein the side arm being fixed into position relative to the mounting bracket with is a locking knob.

25. (Amended) The auxiliary shelf mechanism of claim 24, wherein the means for attaching the auxiliary shelf to a desk comprises a mounting track; the means for rotating the articulating arm mechanism relative to the desk comprises a swivel mechanism attached to the mounting bracket in combination with the mounting track to which the mounting bracket is slidably connected, either directly or indirectly.

Please cancel claim 45.

61. (Once Amended) A mounting mechanism for mounting a support for an art device on a base, comprising:

(1) a mounting member for attachment to said base;

(2) a linkage having a first end for mounting said support and a second end pivotally connected to said mounting member for permitting vertical movement of said support relative to said mounting member between lower and upper positions, said linkage including:

an [a relatively] upper link;

a lower link;

a first end link attached to said support;

a second end link for attachment to said base;

RECEIVED
AUG 01 2001
73600 MAIL ROOM

a plurality of pin joints; and

a crank and slider type joint;

wherein one of said upper and lower links is coupled to said first and second end links by pin joints at each end and the other of said upper and lower links is coupled to said first and second end links at one end by a pin joint and at the other end by said crank and slider joint; and

65. (Once Amended) A mechanism according to claim 64, wherein a coil spring is carried by the pin joint coupling said upper link to said second end link and has opposite ends arranged to engage said upper link and said mounting member.

66. (Once Amended) A mechanism according to claim 64, wherein the force of gravity tends to swing said linkage downwardly about the pin joint coupling said upper link to said second end link to force said first engagement surface into with said second engagement surface.

68. (Once Amended) A mounting mechanism for mounting a support for an art device on a base, comprising:

(1) a mounting member for attachment to said base;

(2) a linkage having a first end for mounting said support and a second end pivotally connected to said mounting member for permitting vertical swinging movement of said support relative to said mounting member between lower and upper positions,

(a) said linkage including an upper link, a lower link, a first end link, and first, second, and third pivot connections having parallel axes, wherein

(i) said upper link has opposite ends pivotally coupled to said first end link and said mounting member by said first and second pivot connections;

(ii) one end of said lower link is pivotally coupled to said first end link by said third pivot connections, and

said second end of said linkage is pivotally connected to said mounting member solely by said second pivot connection; and

(3) a stopping means for releasably restraining said support in a desired position intermediate said lower and upper positions,

said stopping means including a first engagement surface on said linkage and a second engagement surface of said mounting member, said first engagement surface being normally gravitationally biased into engagement with said second engagement surface for releasably restraining said support against downwardly directed vertical swinging movement, and
said first engagement surface is released from engagement with said second engagement surface by applying an upwardly directed manual force to said support.

69. (New claim) An improved auxiliary shelf mechanism for positioning an auxiliary shelf, including a means for attaching the auxiliary shelf to a desk so that the auxiliary shelf may be movably positioned relative to the desk, wherein the improvement comprises:

an articulating arm mechanism comprising:

- a) a mounting bracket, the mounting bracket having a front end and a back end;
- b) a first arm having a rear portion and a front portion, the rear portion of the first arm being pivotally connected to the mounting bracket;
- c) a shelf bracket connected to the front portion of the first arm;

d) a second arm having a front portion and a rear portion, the front portion of the second arm being pivotally connected to the shelf bracket and the rear portion of the second arm being connected to the mounting bracket; and

e) a stopping surface associated with the mounting bracket such that movement of the second arm is restricted when the second arm is translated;

wherein the first and second arms are not parallel to each other.

70. (New claim) The Auxiliary shelf mechanism of claim 69, wherein the rear portion of the second arm is slidably connected to the mounted bracket.

71. (New claim) The auxiliary shelf mechanism of claim 69, wherein the first arm being connected to the mounting bracket by a first pivot and to the shelf bracket by a second pivot and further wherein the second arm is connected to the shelf bracket by a third pivot and to the mounting bracket by a sliding joint.

72. (New claim) The auxiliary shelf mechanism of claim 69, wherein movement of the second arm is restricted by friction between the rear portion of the second arm and the stopping surface.

73. (New claim) The auxiliary shelf mechanism of claim 69, wherein the second arm is fixed into position by engaging interconnecting projections on the rear portion of the second arm and the stopping surface.

74. (New claim) The auxiliary shelf mechanism of claim 69, wherein the rear portion of the second arm and the stopping member comprise complementary series of interlocking teeth.

75. (New claim) The auxiliary shelf mechanism of claim 69, wherein the articulating arm mechanism further comprises means for rotating said mechanism relative to the desk.

76. (New claim) The auxiliary shelf mechanism of claim 69, wherein the means for attaching the auxiliary shelf to the desk comprises a mounting track; a means for rotating the articulating arm mechanism relative to the desk comprises a swivel mechanism attached to the mounting bracket in combination with the mounting track to which the mounting bracket is slidably connected.

77. (New claim) The auxiliary shelf mechanism of claim 69, further comprising a spring for biasing either the first or second arms.

78. (New claim) An improved auxiliary shelf mechanism for positioning an auxiliary shelf, including a means for attaching the auxiliary shelf to a desk so that the auxiliary shelf may be movably positioned relative to the desk, wherein the improvement comprises:

an articulating arm mechanism comprising:

- (a) a mounting bracket, the mounting bracket having a front end and a back end;
- (b) a first arm having a rear portion and a front portion, the rear portion of the first arm being pivotally connected to the mounting bracket;
- (c) a shelf bracket having a shelving surface for supporting an auxiliary shelf thereon, the shelf bracket being pivotally connected to the front portion of the first arm by at least one pivot positioned above the shelving surface;
- (d) a second arm having a front portion and a rear portion, the front portion of the second arm being pivotally connected to the shelf bracket and the rear portion of the second arm being connected to the mounting bracket; and
- (e) a stopping surface being associated with the mounting bracket such that movement of the second arm is restricted when the second arm is translated.

79. (New claim) The auxiliary shelf mechanism of claim 78, wherein the first arm being connected to the mounting bracket by a first pivot and to the shelf bracket by a second pivot and further wherein the second arm is connected to the shelf bracket by a third pivot and to the mounting bracket by a sliding joint.

80. (New claim) The auxiliary shelf mechanism of claim 78, wherein movement of the second arm is restricted by friction between the rear portion of the second arm and the stopping surface.

81. (New claim) The auxiliary shelf mechanism of claim 78, wherein the second arm is fixed into position by engaging interconnecting projections on the rear portion of the second arm and the stopping surface.

82. (New claim) The auxiliary shelf mechanism of claim 78, wherein the rear portion of the second arm and the stopping surface comprise complementary series of interlocking teeth.

83. (New claim) The auxiliary shelf mechanism of claim 78, wherein the articulating arm mechanism further comprises means for rotating said mechanism relative to the desk.

84. (New claim) The auxiliary shelf mechanism of claim 78, wherein the means for attaching the auxiliary shelf to the desk comprises a mounting track; a means for rotating the articulating arm mechanism relative to the desk comprises a swivel mechanism attached to the mounting bracket in combination with the mounting track to which the mounting bracket is slidably connected.

85. (New claim) The auxiliary shelf mechanism of claim 78, wherein the first and second arms are not parallel to each other.

86. (New claim) The auxiliary shelf mechanism of claim 78, wherein the first and second arms are parallel to each other.

87. (New claim) The auxiliary shelf mechanism of claim 78, further comprising a spring for biasing either the first or second arms.

88. (New claim) An improved auxiliary shelf mechanism for positioning an auxiliary shelf, including a means for attaching the auxiliary shelf to a desk so that the auxiliary shelf may be movably positioned relative to the desk, wherein the improvement comprises:

an articulating arm mechanism comprising:

- (a) a mounting bracket, the mounting bracket having a front end and a back end;
- (b) a first arm having a rear portion and a front portion, the rear portion of the first arm being pivotally connected to the mounting bracket;
- (c) a shelf bracket having a shelving surface for positioning a keyboard on top thereof, the shelf bracket being pivotally connected to the front portion of the first arm by at least one pivot positioned above the shelving surface;
- (d) a second arm having a front portion and a rear portion, the front portion of the second arm being pivotally connected to the shelf bracket and the rear portion of the second arm being connected to the mounting bracket;
- (e) a stopping surface being associated with the mounting bracket such that movement of the second arm is restricted by the stopping surface when the second arm is translated;
- (f) said means for attaching the auxiliary shelf to the desk comprises a mounting track; a swivel mechanism associated with the mounting bracket for rotating the articulating arm mechanism relative to the desk; the swivel mechanism positioned in combination with the mounting track to which the mounting bracket is slidably connected; and
- (g) a spring for biasing the first or second arm.

89. (New claim) The auxiliary shelf mechanism of claim 87, wherein the first arm being connected to the mounting bracket by a first pivot and to the shelf bracket by a second pivot and further wherein the second arm is connected to the shelf bracket by a third pivot and to the mounting bracket by a fourth pivot.

90. An improved auxiliary shelf mechanism for positioning an auxiliary shelf, including a means for attaching the auxiliary shelf to a desk so that the auxiliary shelf may be movably positioned relative to the desk, wherein the improvement comprises:

an articulating arm mechanism comprising:

- a) a mounting bracket, the mounting bracket having a front end and a back end;
- b) a first arm having a rear portion and a front portion, the rear portion of the first arm being pivotally connected to the mounting bracket;
- c) a shelf bracket pivotally connected to the front portion of the first arm;
- d) a second arm having a front portion and a rear portion, the front portion of the second arm being pivotally connected to the shelf bracket and the rear portion of the second arm being connected to the mounting bracket;
- e) a stopping surface being associated with the mounting bracket such that movement of the second arm is restricted by the stopping surface when the second arm is translated;
- f) said means for attaching the auxiliary shelf to a desk comprises a mounting track; a means for rotating the articulating arm mechanism relative to the desk comprises a swivel mechanism attached to the mounting bracket in combination with the mounting track to which the mounting bracket is slidably connected; and

- g) a spring for biasing the first or second arms;

wherein the first and second arms are not parallel to each other.

91. (New claim) The auxiliary shelf mechanism of claim 89, wherein the first arm being connected to the shelf bracket by a first pivot rod and the second arm is connected to the shelf bracket by a second pivot rod.

92. (New claim) The auxiliary shelf mechanism of claim 89, wherein movement of the second arm being restricted into position by friction between the rear portion of the second arm and the stopping surface.

93. An improved auxiliary shelf mechanism for positioning an auxiliary shelf, including a means for attaching the auxiliary shelf to a desk so that the auxiliary shelf may be movably positioned relative to the desk, wherein the improvement comprises:

an articulating arm mechanism comprising:

- (a) a mounting bracket, the mounting bracket having a front end and a back end;
- (b) a first arm having a rear portion and a front portion, the rear portion of the first arm being pivotally connected to the mounting bracket;
- (c) a shelf bracket having a shelving surface for positioning a keyboard on top thereof, the shelf bracket being pivotally connected to the front portion of the first arm by at least one pivot positioned above the shelving surface;
- (d) a second arm having a front portion and a rear portion, the front portion of the second arm being pivotally connected to the shelf bracket and the rear portion of the second arm being connected to the mounting bracket;
- (e) a stopping surface associated with the mounting bracket such that movement of the second arm is restricted by the stopping surface when the second arm is translated;

(f) said means for attaching the auxiliary shelf to a desk comprises a mounting track; a swivel mechanism associated with the mounting bracket for rotating the articulating arm mechanism relative to the desk; the swivel mechanism positioned in combination with the mounting track to which the mounting bracket is slidably connected; and

(g) a spring for biasing either the first or second arms;
wherein the first and second arms are not parallel to each other.

94. (New claim) The auxiliary shelf mechanism of claim 92, wherein the first arm being connected to the mounting bracket by a first pivot rod and to the shelf bracket by a second pivot rod and further wherein the second arm is connected to the shelf bracket by a third pivot rod.

95. (New claim) The auxiliary shelf mechanism of claim 92, wherein movement of the second arm is restricted by friction between the rear portion of the second arm and the stopping surface.

96. (New claim) An improved auxiliary shelf mechanism for positioning an auxiliary shelf; said mechanism including at least two linkage arms connecting a mounting bracket capable of being connected to a desk and an auxiliary shelf bracket having a shelving surface for an auxiliary shelf wherein the improvement comprises having at least one pivot connection between a linkage arm and the shelf bracket above the shelving surface.

Exhibit 1

ELEMENTS
OF
MECHANISM

SCHWAMB
MERRILL
JAMES

THIRD
EDITION

JOHN WILEY
AND
SONS
INC.

Elements of Mechanism

PETER SCHWAMB, S.B.

Professor of Machine Design (Retired), Massachusetts Institute of Technology

ALLYNE L. MERRILL, S.B.

Professor of Mechanism, Massachusetts Institute of Technology

WALTER H. JAMES, S.B.

*Assistant Professor of Mechanical Engineering Drawing,
Massachusetts Institute of Technology*

THIRD EDITION, REWRITTEN, ENLARGED, AND RESET

TOTAL ISSUE FORTY THOUSAND

NEW YORK

JOHN WILEY & SONS, INC.

LONDON: CHAPMAN & HALL, LIMITED

1921

COPYRIGHT, 1904, 1905,
BY
PETER SCHWAMB
AND
ALLYNE L. MERRILL

COPYRIGHT, 1921,
BY
PETER SCHWAMB
ALLYNE L. MERRILL,
WALTER H. JAMES

DC turning about D . The mechanism, therefore, is really a four-bar linkage with the lines AB and DC as center lines of the cranks, AD as the line of centers, and BC as the center line of the connecting rod.

Let it now be supposed that the slot is made of greater radius than that shown in the figure, for example, with its center at D_1 . Then the equivalent four-bar linkage would be $ABCD_1$.

Carrying the same idea still further, let the slot be made straight. Then the equivalent center D would be at a point an infinite distance

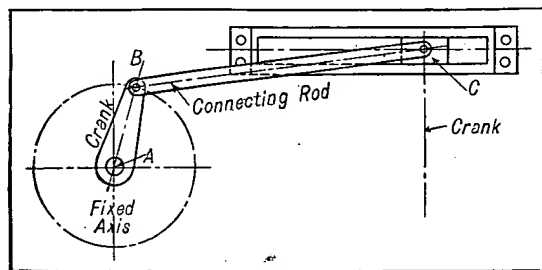


FIG. 275

away. The mechanism, however, would still be the equivalent of a four-bar linkage, as shown in Fig. 275, where AB is one crank, the line through C perpendicular to the slot is the other crank, BC the connecting rod, and a line through A parallel to the crank through C is the line of centers.

Fig. 276 shows the special form in which this linkage commonly occurs, where the center line of the slot passes through the center of

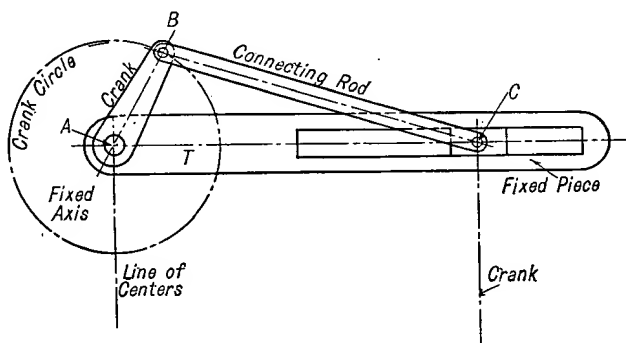


FIG. 276

the shaft A . This is the mechanism formed by the crank shaft, crank, connecting rod, crosshead and crosshead guides of the reciprocating steam engine.

Exhibit 2.



MECHANISMS, LINKAGES, and MECHANICAL CONTROLS

CHROMAS

MECHANISMS, LINKAGES, AND MECHANICAL CONTROLS

Edited by

NICHOLAS P. CHIRONIS

Associate Editor, PRODUCT ENGINEERING

M c G R A W - H I L L B O O K C O M P A N Y

**New York
San Francisco
Toronto
London
Sydney**



MECHANISMS, LINKAGES, AND MECHANICAL
CONTROLS

Copyright © 1965 by McGraw-Hill, Inc. All Rights Reserved.
Printed in the United States of America. This book, or parts there-
of, may not be reproduced in any form without permission of the
publishers. *Library of Congress Catalog Card Number: 65-23552*

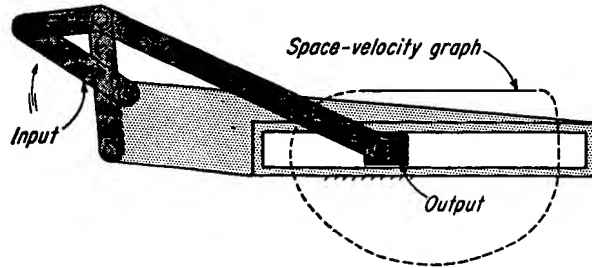
ISBN 07-010775-0

67890 HDBP 7654

ROTARY TO RECIPROCATING

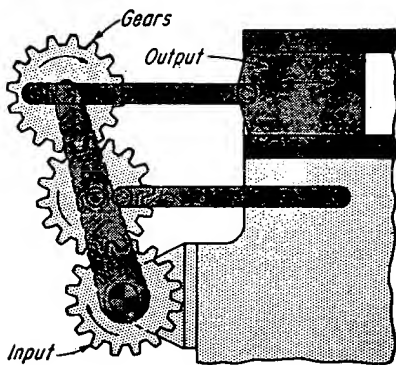
PREBEN W. JENSEN

Four-bar slider mechanism



With proper proportions, the rotation of the input link can impart an almost-constant velocity motion to the slider.

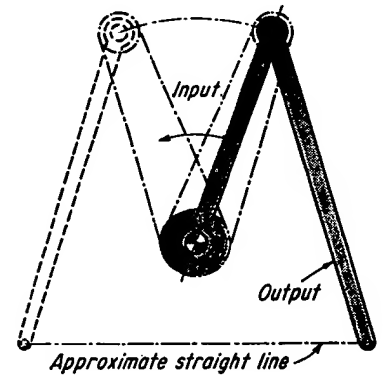
Three-gear stroke multiplier



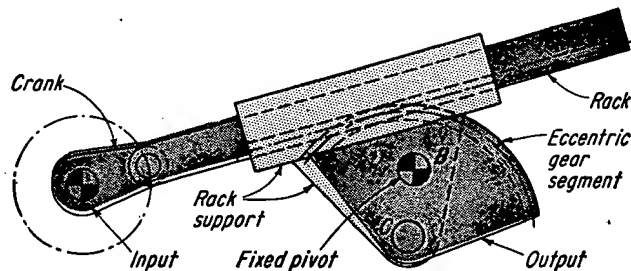
Rotation of the input gear causes the connecting link, attached to the machine frame, to oscillate. This produces a large-stroke reciprocating motion in the output slider.

Rotary motion of the input is translated into linear motion of the linkage end. The linkage is fixed to the smaller sprocket, and the larger sprocket fixed to the frame. For instrumentation.

Oscillating-chain mechanism

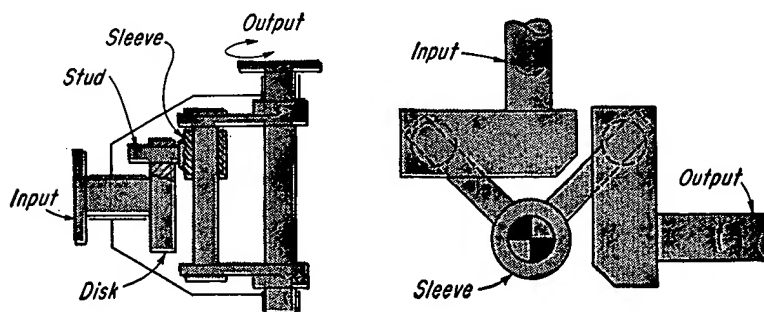


Rack and gear sector



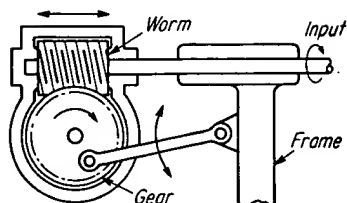
Rotary motion of the input is translated into oscillating motion of the output. The rack support and gear sector are pinned at C, but the gear itself oscillates around B.

Right angle oscillator



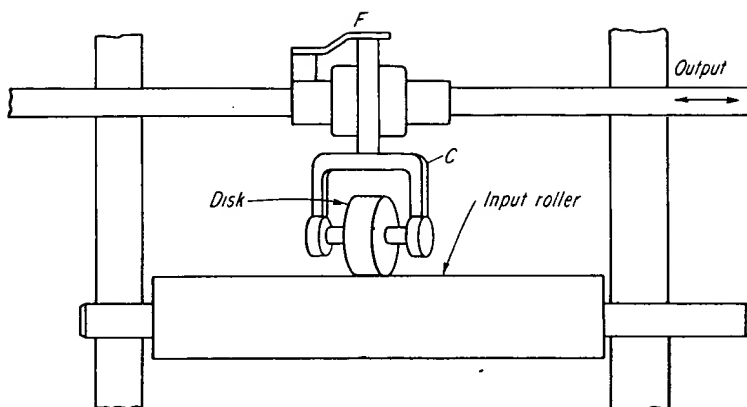
The input shaft and disk (extreme left) drives the stud and sleeve in a circular path. This causes the sleeve to move up and down and imparts an oscillating motion to the output shaft. A second variation is also shown.

Linear reciprocator



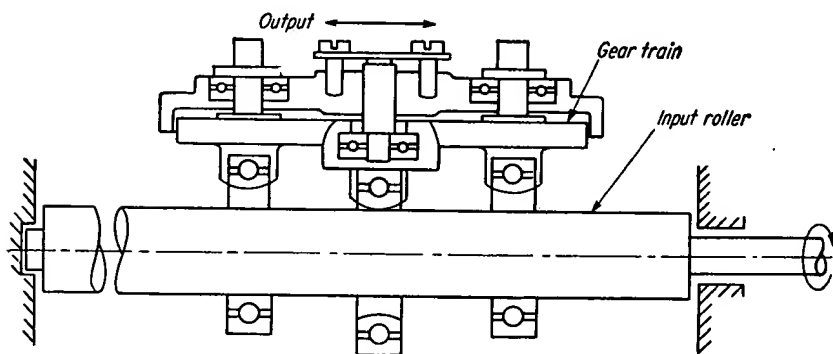
The objective here is to convert a rotary motion into a reciprocating motion that is *in line* with the input shaft. Rotation of the shaft drives the worm gear which is attached to the machine frame by means of a rod. Thus input rotation causes the worm gear to draw itself (and the worm) to the right—thus providing a back and forth motion. Employed in connection with a color-transfer cylinder in printing machines.

Disk and roller drive



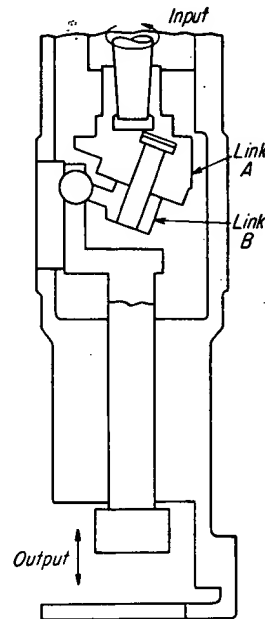
Here a hardened disk, riding at an angle to an input roller, transforms the rotary motion into linear motion *parallel to the axis of the input*. The roller is pressed against the input shaft with the help of a flat spring, *F*. Feed rate is easily varied by changing the angle of the disk. Arrangement can produce an extremely slow feed with a built-in safety factor in case of possible jamming.

Bearings and roller drive



Similar to the previous one, this arrangement avoids large Hertzian stresses between disk and roller by employing three ball bearings in place of the single disk. The inner races of the bearings make contact on one side or the other. Hence a gearing arrangement is required to alternate the angle of the bearings. This arrangement also reduces the bending moment on the shaft.

Reciprocating space crank



Rotary input causes the bottom surface of link *A* to wobble in reference to the center line. Link *B* is free of link *A* but restrained from rotating by the slot. This causes the output member to reciprocate linearly. Employed for filing machine.